



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,098	04/07/2004	Falgun D. Patel	10030458-1	8269
57299	7590	07/21/2006	EXAMINER	
AVAGO TECHNOLOGIES, LTD.			HUGHES, DEANDRA M	
P.O. BOX 1920			ART UNIT	PAPER NUMBER
DENVER, CO 80201-1920			3663	

DATE MAILED: 07/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/820,098	PATEL ET AL.	
	Examiner	Art Unit	
	Deandra M. Hughes	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 16 June 2006.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-20 is/are pending in the application.  
 4a) Of the above claim(s) 13-20 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-12 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 07 April 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Response to Arguments***

1. Applicant's argument regarding the 35 USC § 112-2<sup>nd</sup> ¶ rejection, see Remarks (page 10), filed 6/16/06, has been fully considered and is persuasive. Accordingly, the 35 USC § 112 - 2<sup>nd</sup> ¶ rejection of claims 5 and 11 has been withdrawn.
2. Applicant's argument, see Remarks, filed 6/16/06 (pg. 6, 1<sup>st</sup> ¶), with respect to the rejection of claim 1 under 102(e), has been fully considered and is persuasive. Therefore, the rejection of claim 1 under Duling (US 2003/0147127) has been withdrawn.
3. The following arguments by the Applicant (filed 6/16/06) have been fully considered but they are not persuasive. Applicant argues:
  - (A) "Figure 6.3 of the *Becker* publication as cited by the Examiner discloses that gain can vary as a function of pump power, not that the signal gain and the signal loss are about equal." (pg. 7, lines 10-12);
  - (B) "Regarding claims 2 and 7, the Abstract of the *LaBorde* patent cited by the Examiner discloses glass doped with up to 5 weight % erbium oxide, not the core being doped with at least one species of rare earth ion in the range of 5 to 75% as recited in claim 2 and 7." (pg. 8, lines 17-19)

In response to applicant's Argument (A), the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Argument (B) is unpersuasive because the Examiner erbium oxide is a rare-earth and further, the Examiner considers the glass doped with up to 5 weight % to be in the claimed range of 5 to 75%. See MPEP §2131.03.

***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. Claims 1-3, 6-8, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Varner (US 6,603,909 filed Nov. 5, 2001) in view of Becker et al. (Erbium-Doped Fiber Amplifiers and Technology, 1999).

With regard to claim 1, Varner discloses an optical element, comprising:

- a loss element having a signal loss (e.g. fig. 9c, section of #950 between #990 and #960);
- and a rare earth doped gain element (e.g., section of #950 between #960 and #930) optically connected in series with the loss element (the 1<sup>st</sup> section of #950 and the 2<sup>nd</sup> section of #950 are serially connected);
- the rare earth doped gain element (col. 5, line 10; Erbium is a rare-earth) operable to produce a signal gain (amplifiers impart gain).

Varner does not specifically disclose that the signal gain and the signal loss are about equal. As it is well-known in the art, Becker teaches gain control of an EDFA via pump power control (e.g. see fig. 6.3). It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to adjust the pump power of the Varner's pump (#910) so that signal gain equals signal loss for the

Art Unit: 3663

advantage compensating for signal attenuation thereby ensuring reception at the receiver.

With regard to claim 6, the loss element (#950) is a Er-doped waveguide.

Claims 2-3, 7-8, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Varner (US 6,603,909 filed Nov. 5, 2001) in view of Becker et al. (Erbium-Doped Fiber Amplifiers and Technology, 1999) as applied to claim 1 above, and further in view of LaBorde (US 5,475,528 published Dec. 12, 1995).

With regard to claims 2-3 and 8, Varner in view of Becker does not specifically disclose doping the core with at least 5 wt% of erbium. However, this is well known in the art, as is taught by LaBorde (e.g. see Abstract). It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to dope the gain element with at least 5 wt% of erbium for the advantage of increasing pump power conversion.

With regard to claim 7, rare earth doped amplifiers inherently operate according to stimulated emission.

With regard to claim 12, the amplifying fiber of Varner (#950) can only impart gain to the signal via the pump signal. If the pump is not coupled to the amplifier, then it cannot impart gain. Consequently, the gain element is inherently in the on state when the pump power is coupled to the gain element.

6. Claims 4 and 9-10 rejected under 35 U.S.C. 103(a) as being unpatentable Varner (US 6,603,909 filed Nov. 5, 2001) in view of Becker et al. (Erbium-Doped Fiber

Amplifiers and Technology, 1999) as applied to claim 1 above, and further in view of Hayden (US 6,430,349 published Aug. 6, 2002).

With regard to claims 4 and 9, Varner in view of Becker does not specifically disclose that the rare-earth ion comprises  $\text{Er}^{3+}$  and  $\text{Yb}^{3+}$  in the range of 5 to 75 wt%. However, Hayden teaches doping with  $\text{Er}^{3+}$  and  $\text{Yb}^{3+}$  in the range of 5 to 75 wt% (col. 4, lines 20-25). It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to dope the fiber as is taught by Hayden for the advantage of optimizing the gain profile to the signal bandwidth.

With regard to claim 10, Varner in view of Becker does not specifically disclose doping the core with silver atoms. However, Hayden teaches doping the core with silver atoms (col. 5, line 1). It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to dope the core with silver for the advantage of a sensitizing agent.

7. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Varner (US 6,603,909 filed Nov. 5, 2001) in view of Becker et al. (Erbium-Doped Fiber Amplifiers and Technology, 1999) as applied to claim 7 above, and further in view of Nilsson (US 2002/0030881 filed Aug. 7, 2001).

Varner in view of Becker does not specifically disclose that the cladding is doped with a rare earth ion. However, Nilsson teaches doping a cladding with a rare earth ion (paragraph [0040]). It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to dope the cladding with a rare earth ion for the advantage of optimizing the gain profile to the signal bandwidth.

***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deandra M. Hughes whose telephone number is 571-272-6982. The examiner can normally be reached on M-F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

Art Unit: 3663

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Deandra M Hughes  
Primary Examiner  
Art Unit 3663